



6th Annual GIS Day @ KU Symposium

Web 2.0 and Geospatial Convergence

Geoff Zeiss, Director of Technology

Autodesk®



Worldwide Challenges

Global Climate Change



The Norwegian Nobel Committee

THE NOBEL PEACE PRIZE FOR 2007

The Norwegian Nobel Committee has decided that the Nobel Peace Prize for 2007 is to be shared, in two equal parts, between the Intergovernmental Panel on Climate Change (IPCC) and Albert Arnold (Al) Gore Jr. for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.

Sustainable Infrastructure

- **LEED**

- *Leadership in Energy and Environmental Design*
- Standards for environmentally sustainable construction
- U.S. Green Building Council (USGBC)
- Inception in 1998

- **As of July 2007**

- 14,000 projects
- 50 US States and 30 countries
- 1.062 billion square feet



Aging and Impaired Infrastructure



Singapore Nicoll Highway

Subsidence

Expressway

verside

explosion



Minneapolis Bridge Collapse 2007



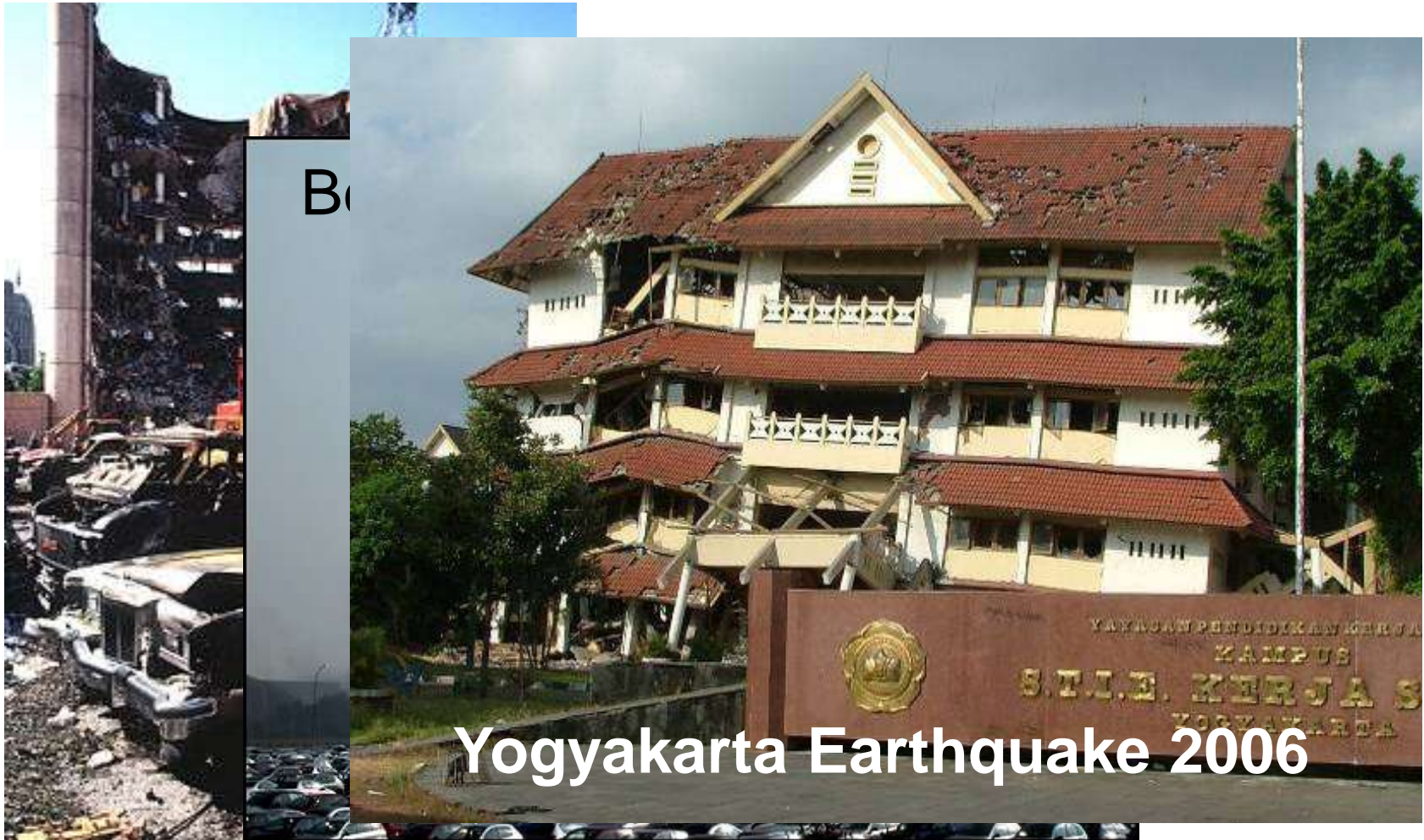
Quebec Overpass Collapse

2006

Northeast Blackout 2003



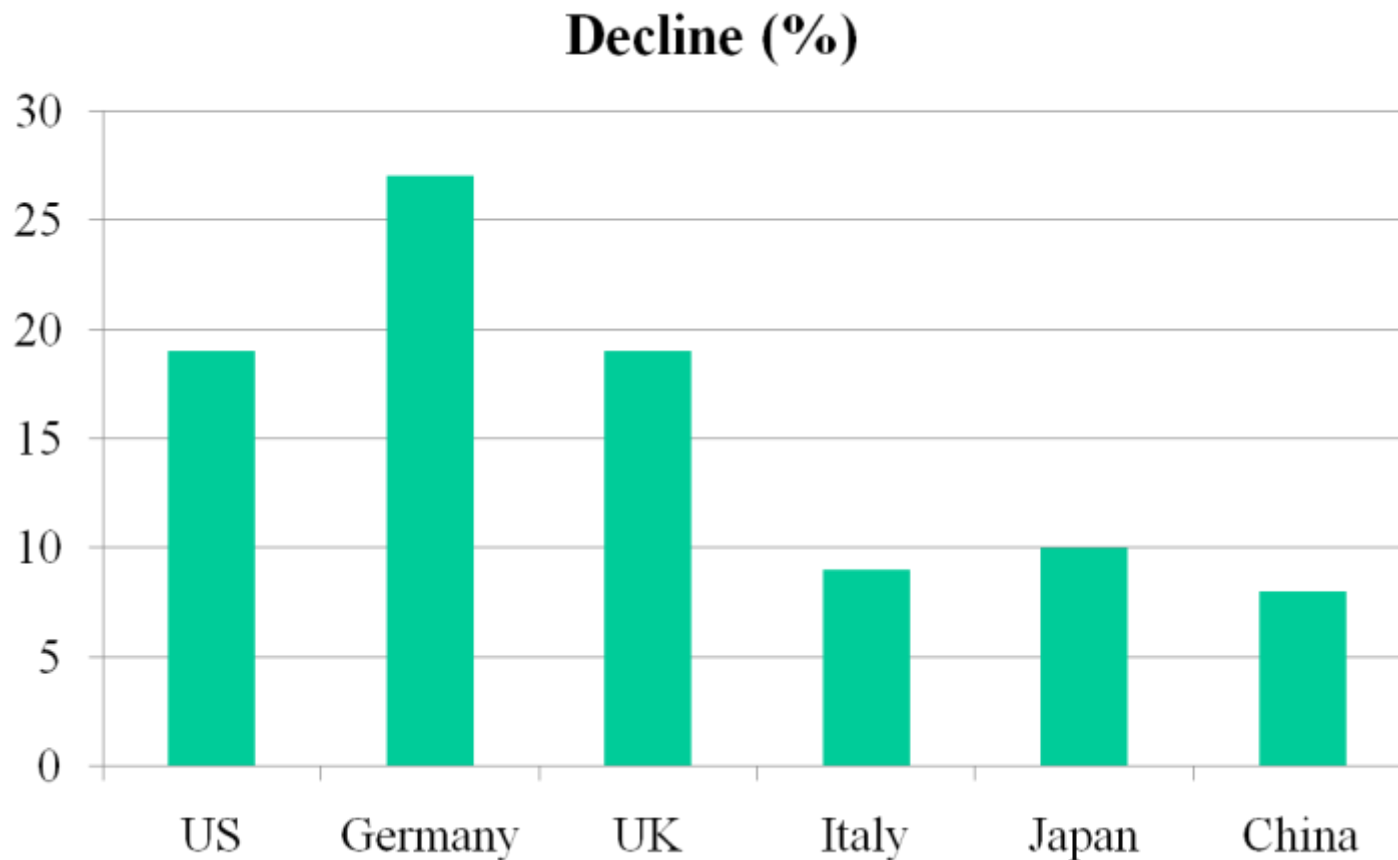
Emergency Response Needs



Oklahoma City 1995

Challenge: Aging Workforce

Decline in Number of Workers Aged 35-44 by 2010



Annual Construction Spend

Worldwide \$ 2.3 trillion per year

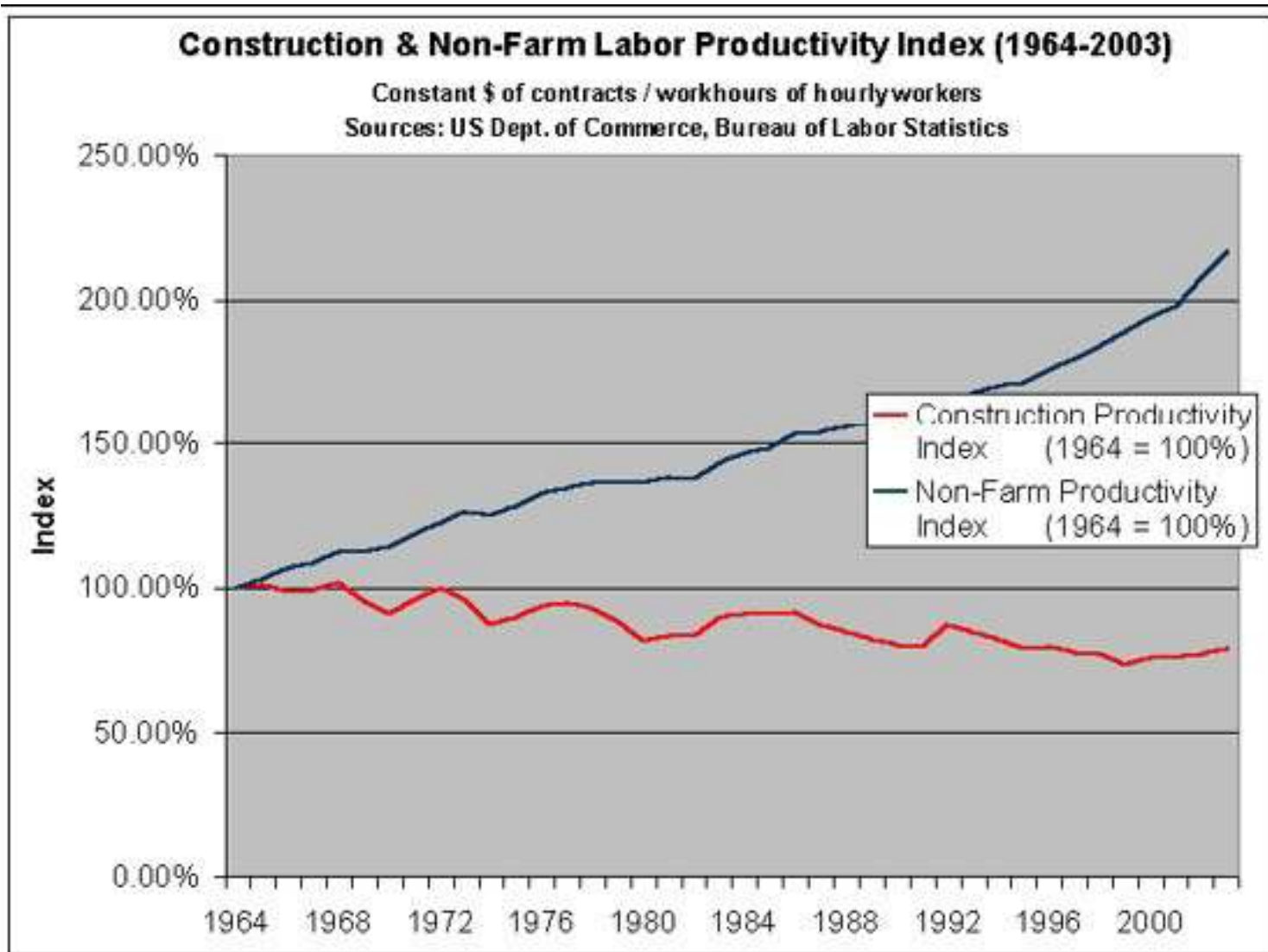
China \$ 88 billion (1Q 2007)

India \$ 50 billion per year

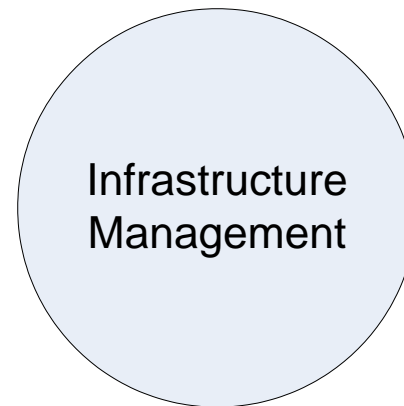
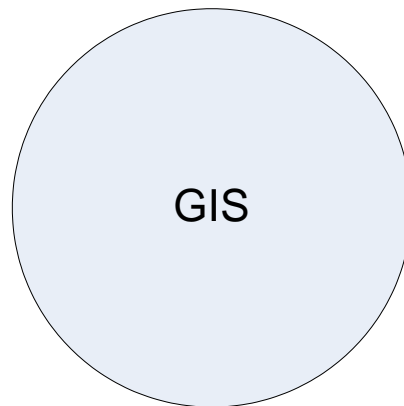
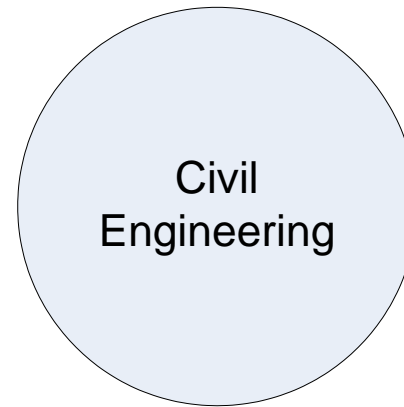
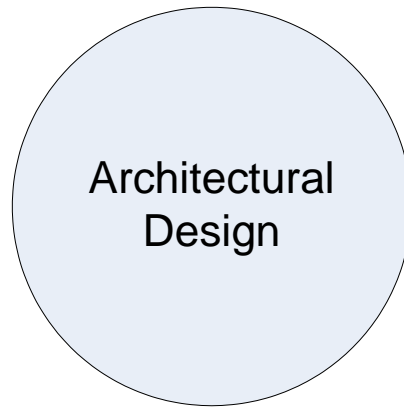
Canada \$68 billion (in 97\$) per year

US \$1.2 trillion per year

Challenge: Productivity



Operational Efficiency: Islands of Information



Operational Efficiency: Value of Interoperability

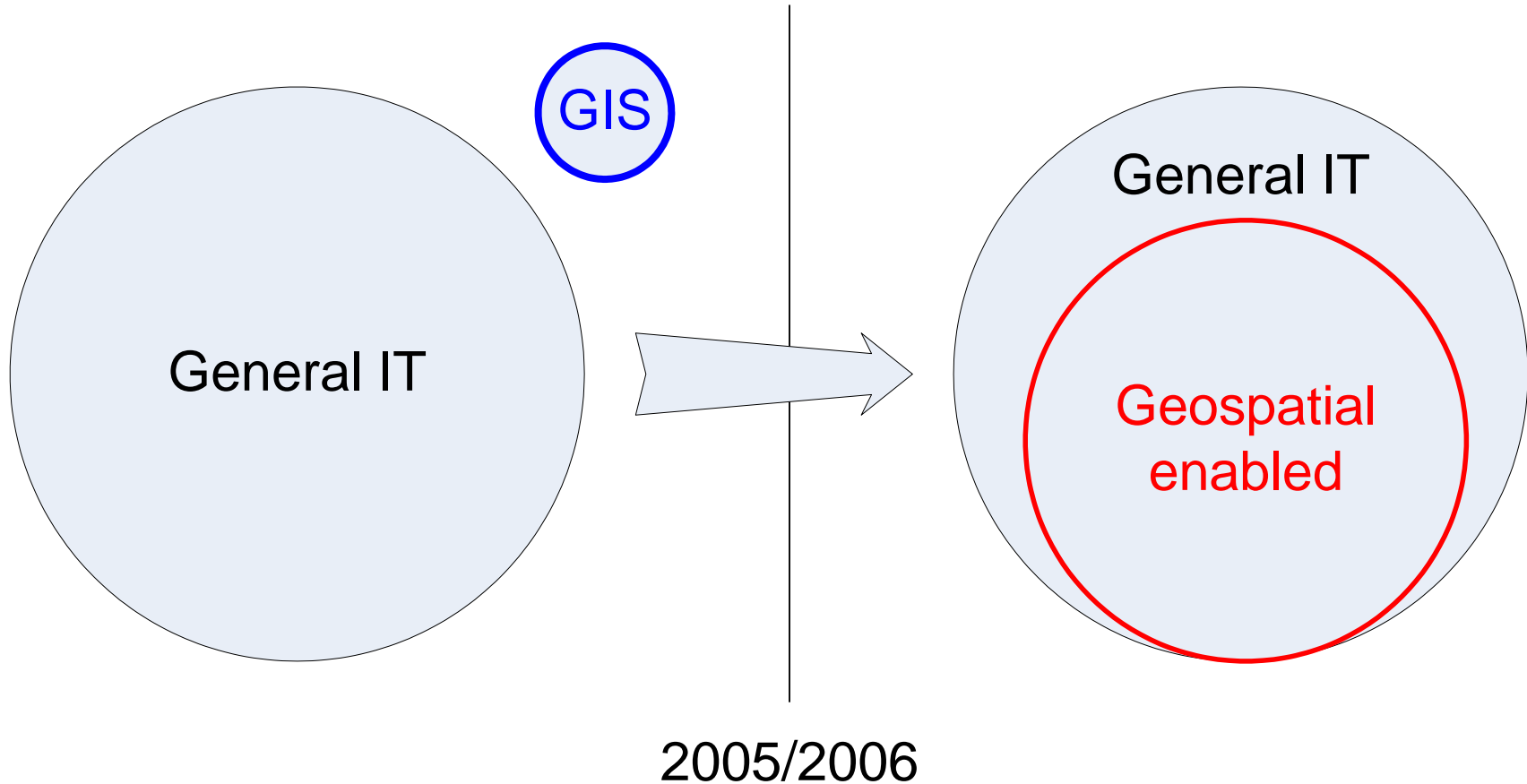
2002 National Institute of Standards and Technology (NIST) Study

- Quantified efficiency losses in the U.S. capital facilities industry from inadequate interoperability over entire facility life-cycle.
- Estimated poor interoperability costs **\$15.8 billion**
- “Likely to be a conservative figure” - NIST



Industry is Developing New Technologies

Location-enabling IT



Examples: Web search, RDBMS, CAD, architectural design, engineering,
...

Open Standards



Advancing open standards for the information society

Web 2.0 Enables Participation

WIKIPEDIA

English

The Free Encyclopedia
1 618 000+ articles

Français

L'encyclopédie libre
438 000+ articles

日本語

フリー百科事典
322 000+ 記事



Google Earth



OSGeo

Your Open Source Compass



Journal home

Advance online
publication

Current issue

Archive

Supplements

Web focuses

Multimedia

About the journal

Journal home >

News

Nature 438, 500

Special Report

Internet encyclopaedias go head to head

Jim Giles

Jimmy Wales' Wikipedia comes close to Britannica in terms of the accuracy of its science entries, a *Nature* investigation finds.

3D Simulation

Experience Before You Build



3D Cityscapes



Convergence Enables 3D Urban Simulation

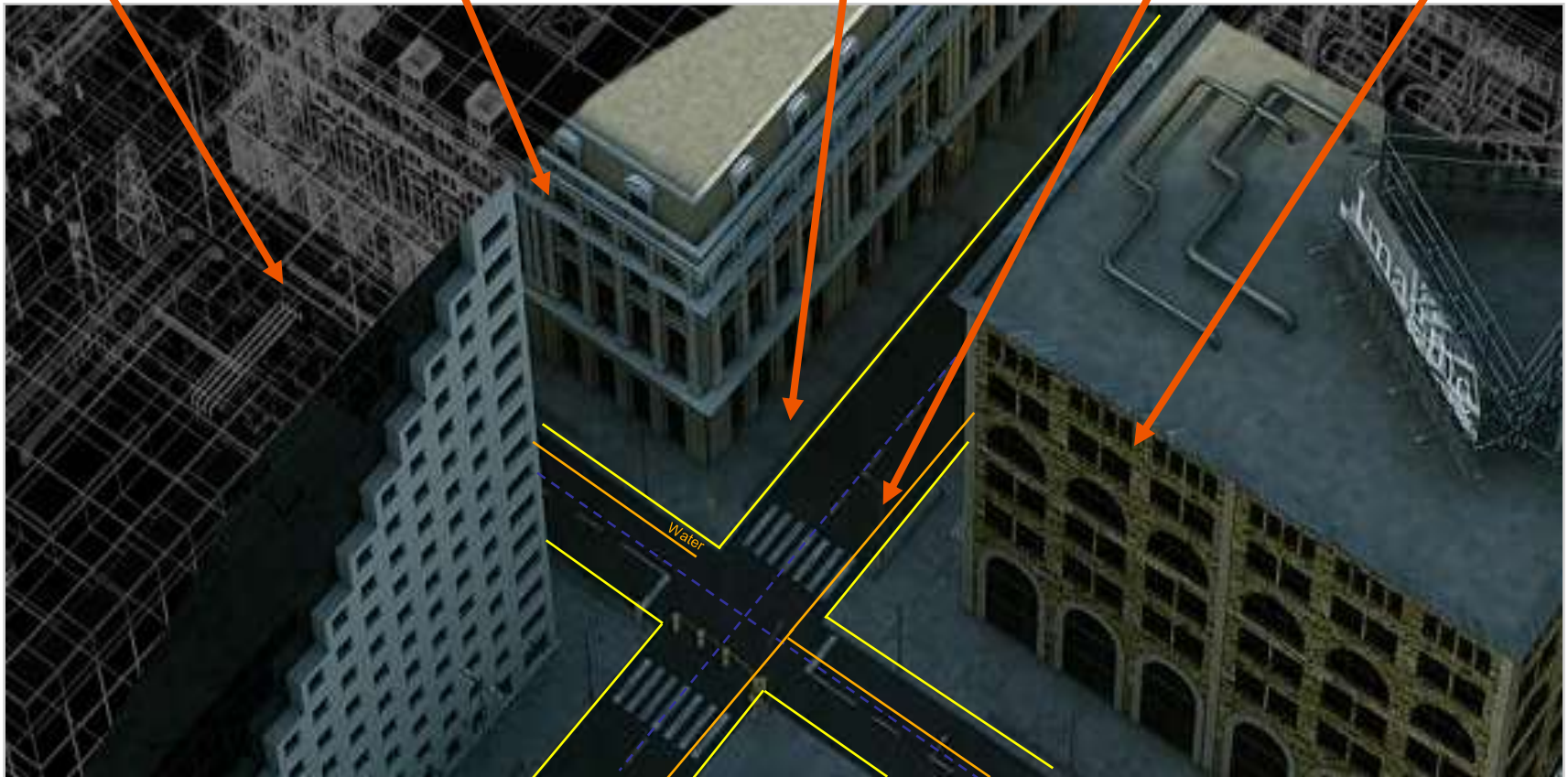
Building structure & interior design

Mechanical, electrical, & plumbing detail

GIS street and parcel information

Underground utility data

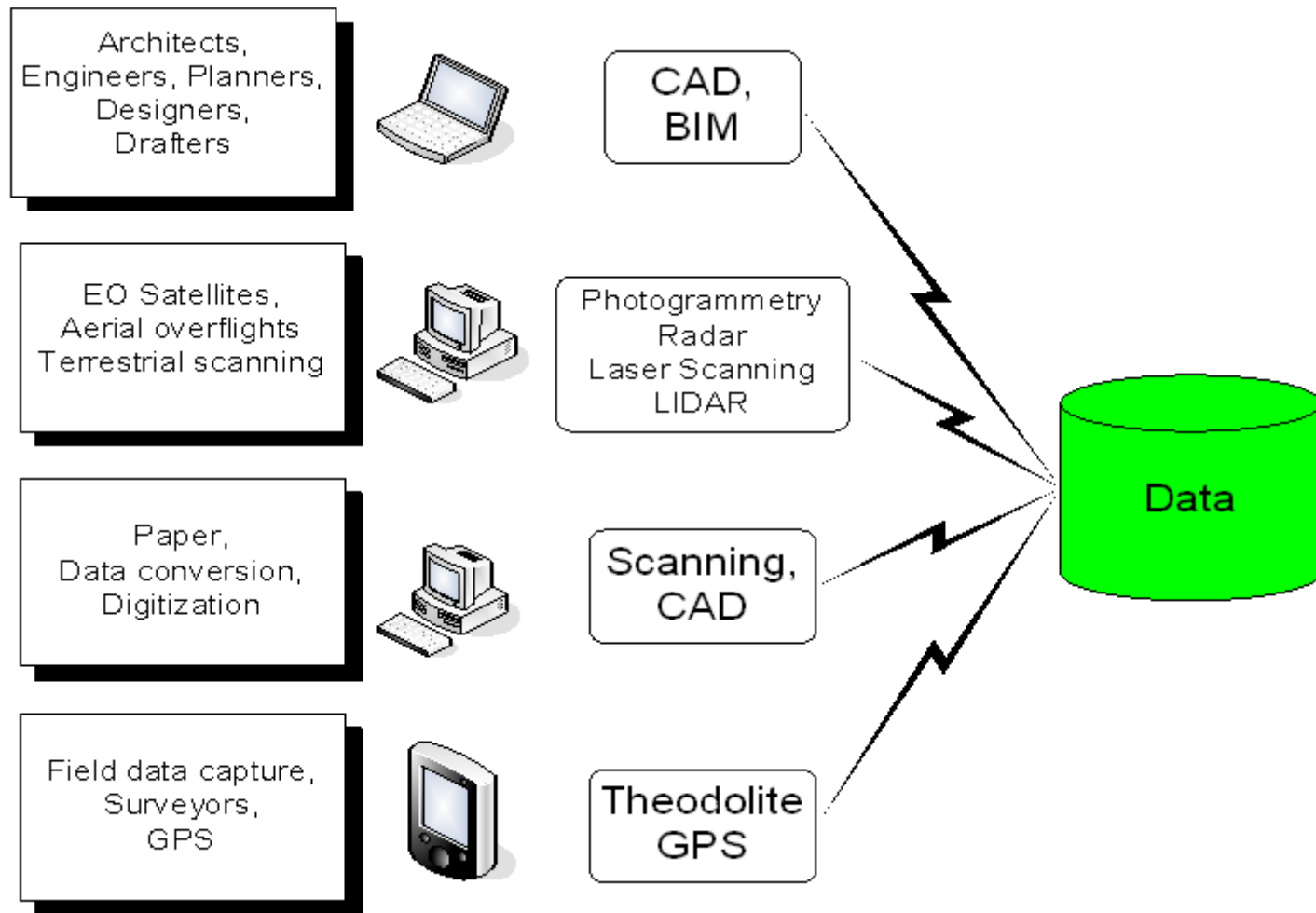
Realistic visualization



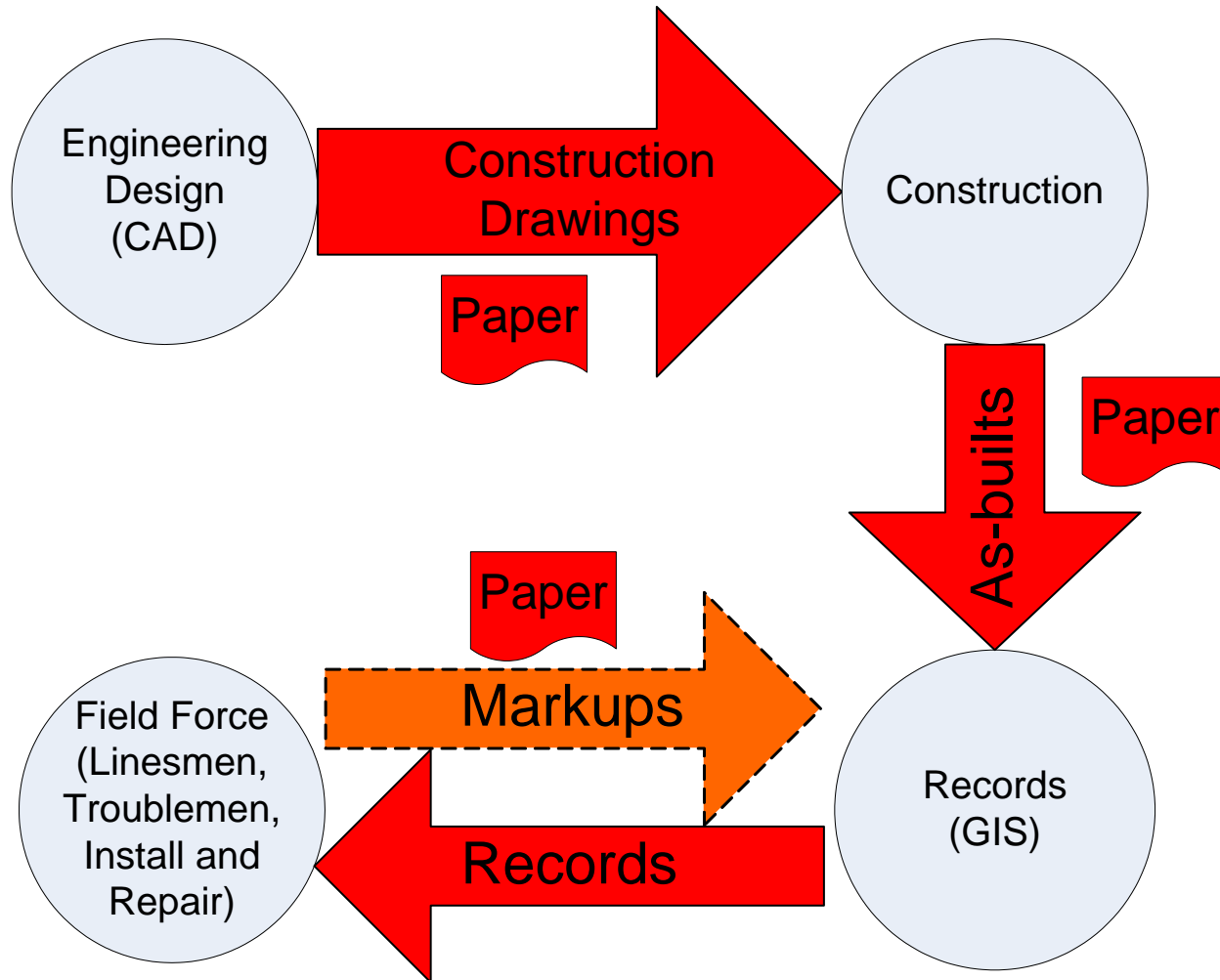


Challenge: Aging Workforce in Utilities and Telcos

CAD/BIM is a Primary Data Source of Precision Infrastructure Information



Inefficient Flow of Infrastructure Information



Aging Workforce in the Utility Industry

- **Average age of utility workers is close to 50**
- **By 2010, as many as 60 percent of today's experienced utility workers will retire.**
 - Study by American Public Power Assn
- **Aging work force is #1 concern of utility HR executives**
 - Survey by *Carnegie Mellon University Electricity Industry Center*
- **20 % decline in productivity forecasted**
 - *Booz Allen study*

What is Web 2.0 ?

Web 1.0

DoubleClick

Ofoto

Akamai

mp3.com

Britannica Online

personal websites

Evite

Domain name speculation

Page views

Screen scraping

Publishing

Content management systems

Directories (taxonomy)

Stickiness

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Web 2.0

Google AdSense

Flickr

BitTorrent

Napster

Wikipedia

blogging

upcoming.org and EVDB

search engine optimization

cost per click

web services

Participation

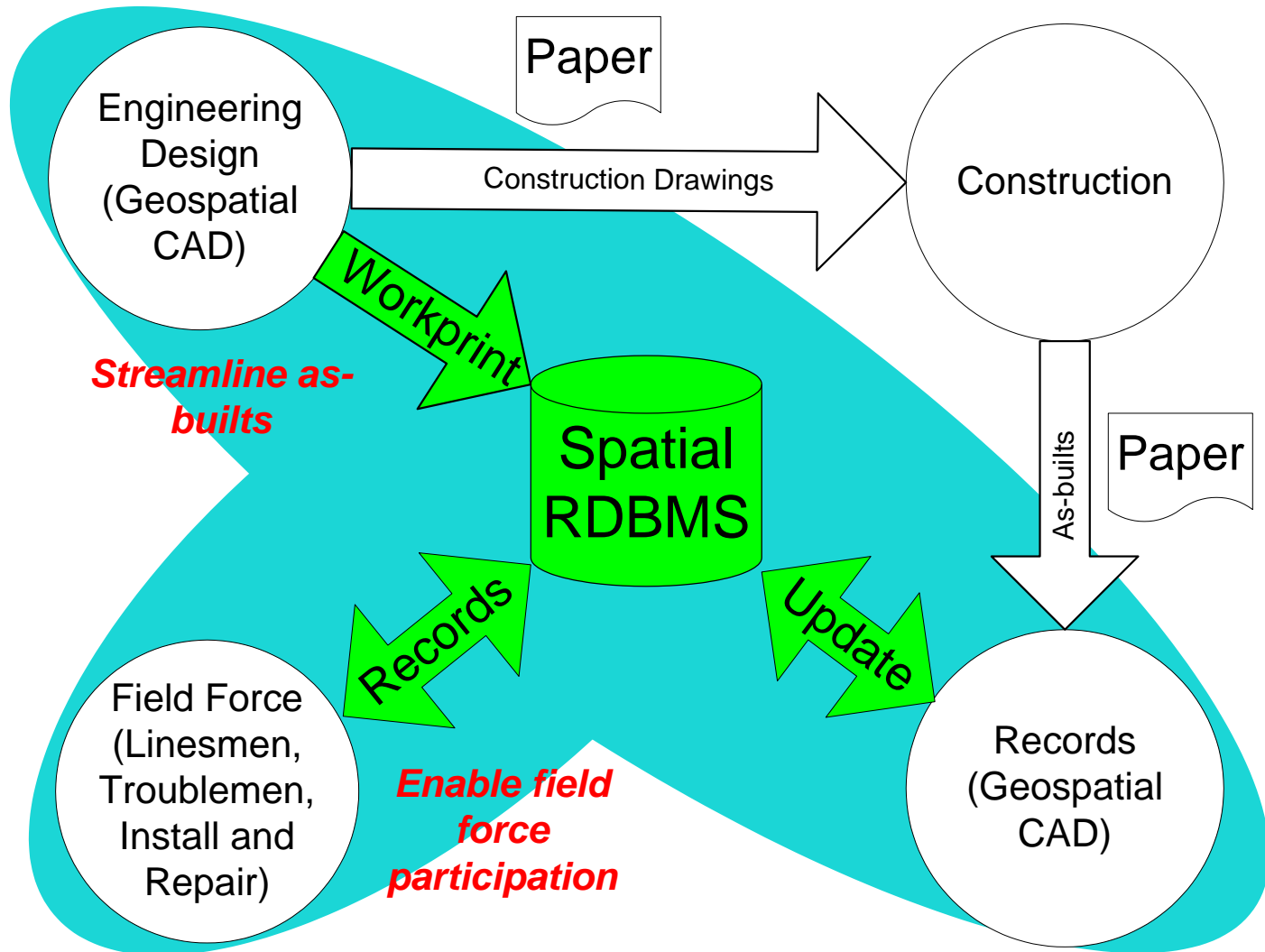
wikis

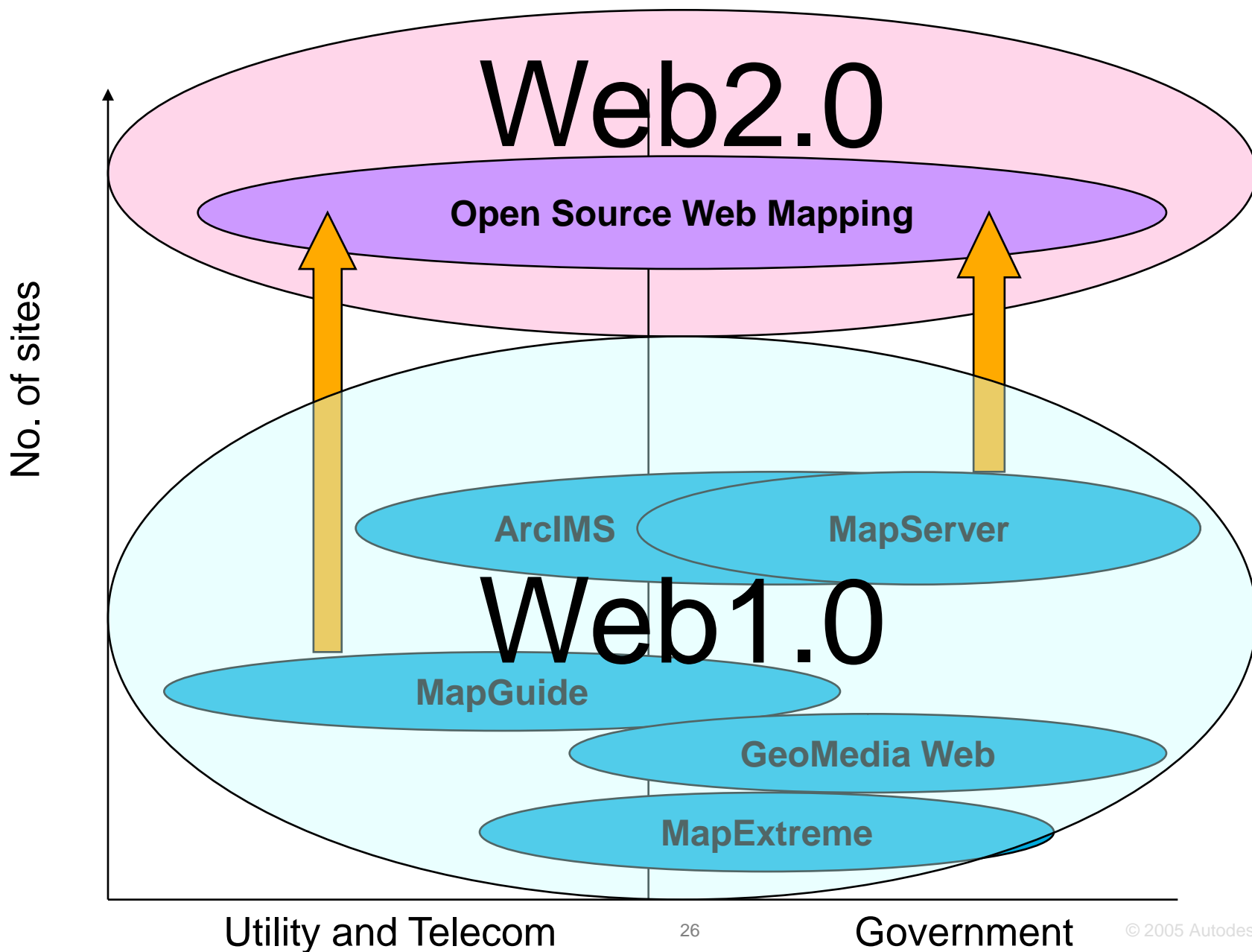
tagging ("folksonomy")

syndication

Source: Tim O'Reilly "What is Web 2.0?"

Web 2.0 Enables Field Participation





Open Source Geospatial Foundation



Web Mapping

MapServer
MapGuide Open Source
OpenLayers
MapBender
MapBuilder

Geospatial Libraries

GDAL/OGR
GeoTools
Feature Data Object (FDO)

Desktop Applications

GRASS
OSSIM
Quantum GIS

Metadata Catalog

GeoNetwork opensource

Web 2.0 Open Source Web Mapping Platform

Desktop
Applications

Spatially-
enabled
CAD
Desktop

Web
Applications

Fusion

MapGuide
Open Source

Feature Data Object API

SDF

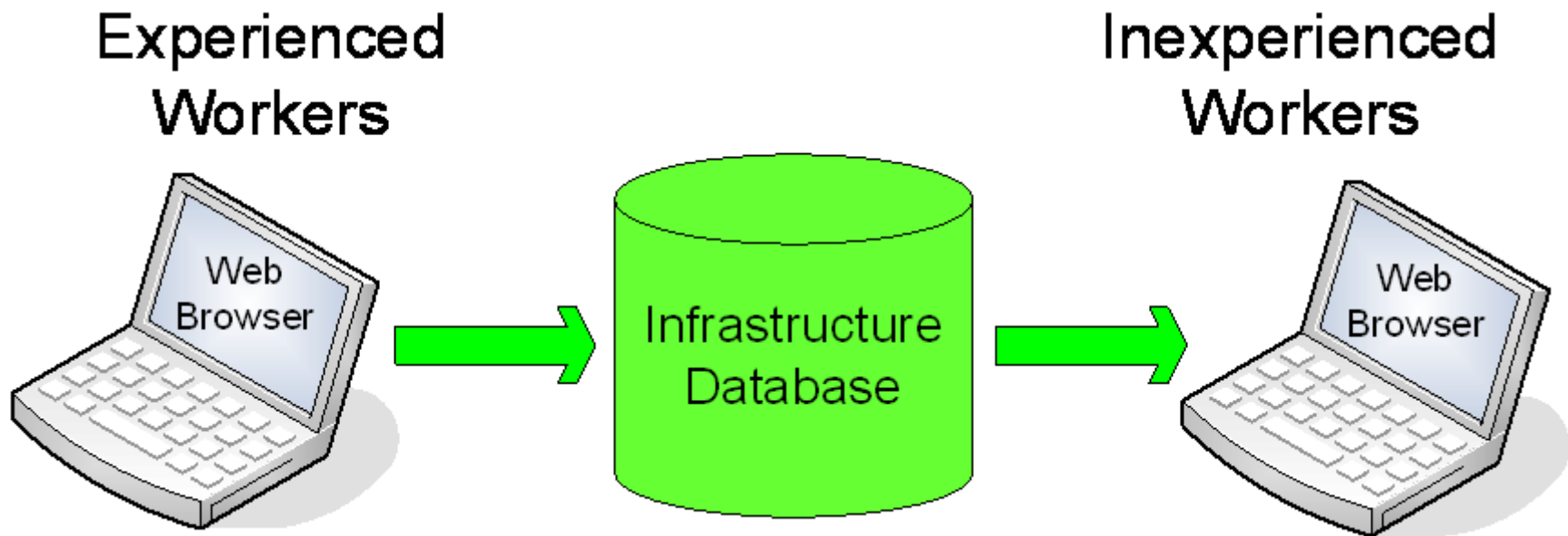
Shape

ArcSDE

MySQL

Oracle
Spatial

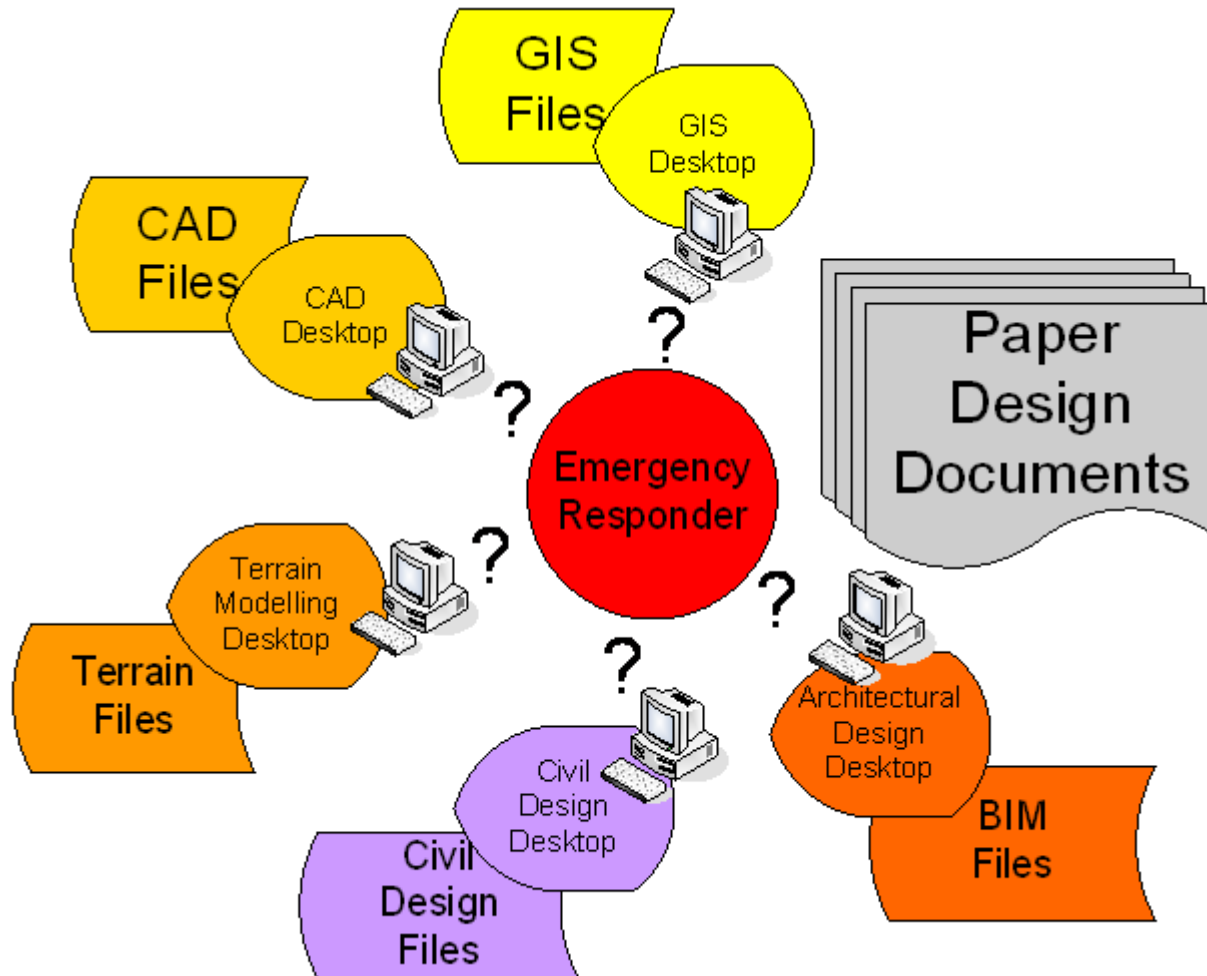
Web 2.0 and the Aging Workforce





Convergence: First Responders

What is the Problem ?



What Does a First Responder Need ?

OUTSIDE



3D exterior urban visualization

Including:

- Utility structures
- Full city blocks of 3D detail
- Precise spatial orientation
- Line of Sight calculations
- Space – to – Sidewalk view

INSIDE



Full interior, 3D visualization

Including:

- Utility / HVAC systems
- Furniture
- Mechanized lifts / elevators
- Walls, doors, windows
- Precision architectural detail

UNDER

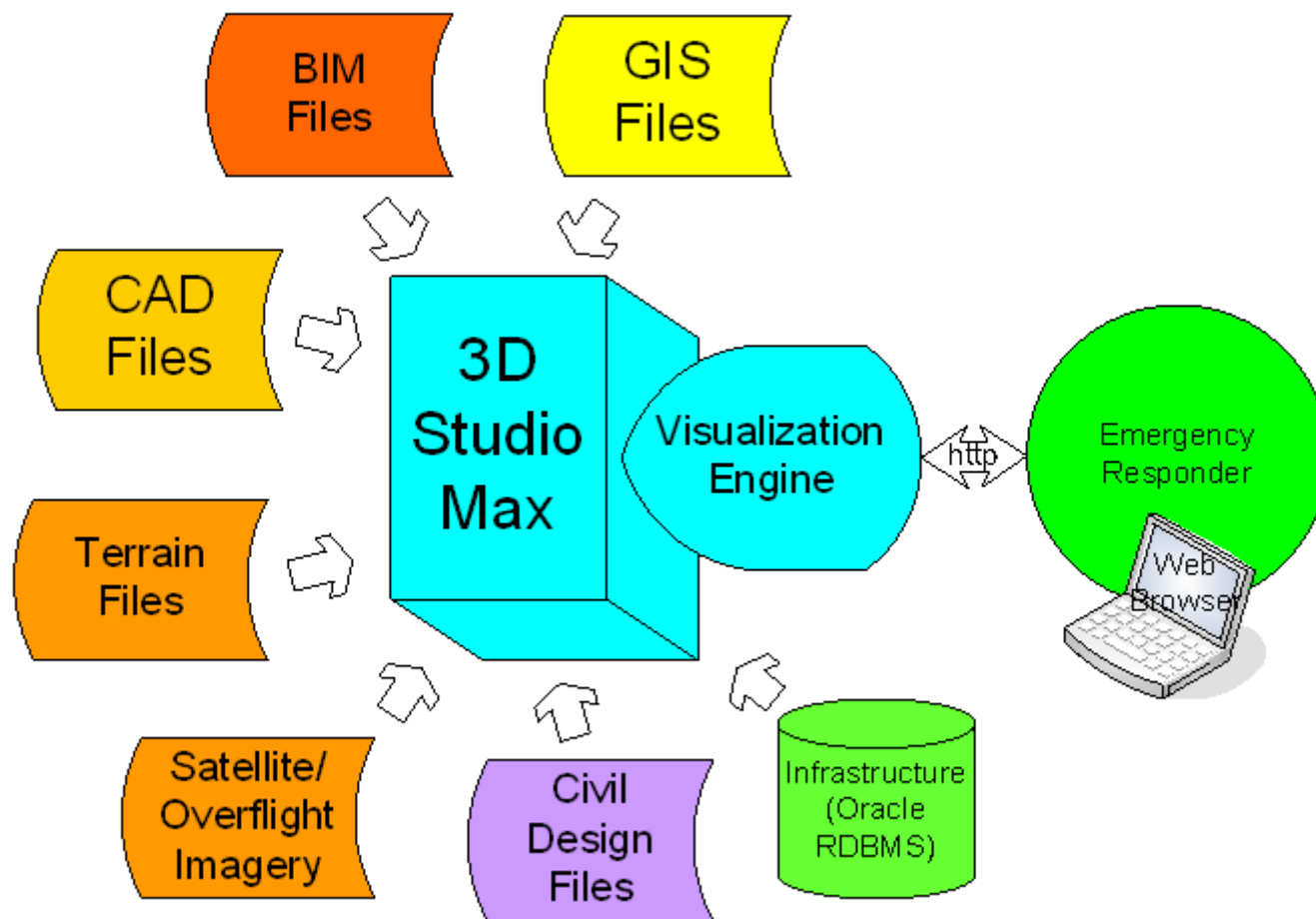


3D subterranean visualization

Including:

- Sewer systems
- Utility / Phone systems
- Electrical systems
- Access routes / portals
- Precision CAD detail

How Did We Do It ?



“Like SIMCity, but with real data”



Convergence: Citizen Communication



Summary

- **Worldwide challenges: global climate change, aging infrastructure, aging workforce, productivity**
- **New technologies are being developed to address these challenges.**
- ***Convergence* is changing the way infrastructure and buildings are being designed, managed, and operated**
- **Provides important benefits to utilities, telcos, and government.**

Autodesk®

www.osgeo.org

geoff.zeiss@autodesk.com

geospatial.blogs.com